

CLAIMS

1. DNA coding for a chimeric receptor containing two or more independent polypeptide chains each of said chains comprising in a N- to C-terminus sequence:
- (1) an extracellular ligand association domain;
- (2) a transmembrane domain; and
- (3) one or more intracellular domains;
- provided that at least two of said domains in one chain are not naturally fused to each other.
2. DNA according to Claim 1 wherein each extracellular ligand association domain coded for is an antibody variable region (V_H or V_L) domain, a T-cell receptor variable region domain ($TCR\alpha$, $TCR\beta$, $TCR\gamma$, $TCR\delta$), $CD8\alpha$, $CD8\beta$, $CD11a$, $CD11b$, $CD11c$, $CD18$, $CD29$, $CD49a$, $CD49b$, $CD49c$, $CD49d$, $CD49e$, $CD49f$, $CD61$, $CD41$ or $CD51$ chain or a fragment thereof.
3. DNA according to Claim 2 wherein each association domain is structurally different to each other.
4. DNA according to Claim 1 wherein the ligand association domains of the chimeric receptor coded for are a V_H domain paired with a V_L domain, two or more $TCR\alpha$, $TCR\beta$, $TCR\gamma$, and/or $TCR\delta$ domains, a $CD8\alpha$ or β homo- or heterodimer, $CD18$ paired with one or more of $CD11a$, b , or c , $CD29$ paired with one or more of $CD49a$, b , c , d , e , or f , and $CD61$ paired with $CD41c$ and/or $CD51$.
5. DNA according to any of the preceding Claims wherein each intracellular domain coded for is a naturally occurring polypeptide signalling sequence.
6. DNA according to Claim 5 wherein each signalling sequence is all or part of the zeta, eta or epsilon chain derived from the T-cell receptor; $CD28$; $CD4$; $CD8$; the γ chain of a Fc receptor; a signalling component from a cytokine receptor, a colony stimulating factor

Claim 1

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receptor, a tyrosine kinase and binding domains thereof; or an adhesion molecule.

- 5 7. DNA according to ~~any one of Claims 1 to 6~~ ^{Claim 1} wherein the transmembrane domain coded for is an oligo- or polypeptide derived from all or part of the alpha, beta or zeta chain of the T-cell receptor, CD28, CD8, CD4, CD3ε, CD45 and members of the tetraspan family, a cytokine receptor, or a colony stimulating factor receptor.
- 10 8. DNA according to ~~any one of Claims 1 to 7~~ ^{claim 1} wherein each independent polypeptide chain coded for additionally contains a spacer domain positioned between the ligand association domain and the transmembrane domain.
- 15 9. DNA according to Claim 8 wherein each spacer domain is a polypeptide comprising 20 to 100 amino acids.
- 20 10. DNA according to ~~any one of Claims 1 to 9~~ ^{claim 1} wherein each independent polypeptide chain coded for additionally has a secretion signal sequence attached to the N-terminus of the association domain of each chain.
- 25 11. DNA according to ~~any of the preceding Claims~~ ^{claim 1} wherein the chimeric receptor coded for has two independent polypeptide chains.
- 30 12. DNA according to Claim 11 wherein one polypeptide chain has a ligand association domain which is a V_H domain or a fragment thereof, and the other has a ligand association domain which is a V_L domain or a fragment thereof.
- 35 13. DNA according to ~~any one of Claims 1 to 12~~ ^{claim 1} in association with a carrier.
14. DNA according to Claim 13 wherein the carrier is a viral vector, a liposomal vector, a cationic lipid or an antibody.

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15. DNA according to Claim 13 wherein the carrier is a targeted carrier.

16. DNA according to ~~any one of Claims 1 to 15~~ which is located on a plasmid. *Claim 1*

17. Plasmid pHMF374 as described in Figure 3 herein.

18. An effector cell containing DNA or a plasmid according to ~~any one of Claims 1 to 17~~. *Claim 1*

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